

U.S. Patent Application Serial No. **10/511,442**  
Amendment filed December 28, 2006  
Reply to OA dated September 22, 2006

**REMARKS**

Claims 1, 5, 6, 10-13, 16, 17 and 20 are pending.

The support for the claim amendments is as follows: Claims 1, 13 and 17: ([0085] to [0087] of this application's published document 2005-0131091) and Claim 6: (Claim 1). The applicants respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated September 22, 2006.

**Claims 6, 8, and 21 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a precious claim. (Office Action, p.2)**

Claims 8 and 21 are canceled making this objection now moot with respect to these claims.

With respect to claim 6, this objection is overcome by limiting halogen-containing compounds to specifically those with a boiling point of about 10 to about 60 °C and a thermal conductivity of about 8 to about 20 mW/mK, as recited.

It is respectfully requested that this objection be withdrawn.

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**Claims 6, 8, and 21 are rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. (Office Action, p.3)**

Claims 8 and 21 are canceled making this rejection now moot with respect to these claims.

With respect to claim 6, this rejection is overcome by limiting halogen-containing compounds to specifically those with a boiling point of about 10 to about 60 °C and a thermal conductivity of about 8 to about 20 mW/mK, as recited.

It is respectfully requested that this rejection be withdrawn.

**Claims 3, 15, and 17 are rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. (Office Action, p.3)**

Claims 3 and 15 are canceled making this rejection now moot with respect to these claims.

Claim 17, as amended, now recites that a premix comprises a blowing agent and at least one polyol, and the blowing agent is a mixture comprising 1,1,1,3,3-pentafluorobutane and at least one halogen-containing compound. This amendment clarifies the claim and should obviate the rejection.

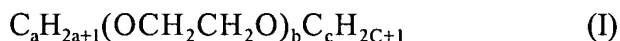
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**Claims 1, 3, 5, 6, 8, 10-13, 15-17 and 19-21 are rejected under 35USC102(e) as being anticipated by EP1,219,674. (Office Action, p.4)**

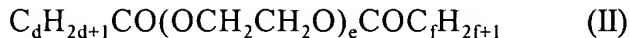
The applicants will show below that EP 1,219,674 fails to anticipate or even render obvious the claims as currently amended.

The glycol compounds recited in claim 1 are clearly different in structure and use from those disclosed in EP1,219,674.

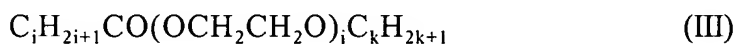
The glycol compounds defined in claim 1 are those represented by formulae (I) to (III):



[wherein a = 1, 2, 3 or 4; b = 1, 2 or 3; and c = 1, 2, 3 or 4];



[wherein d = 0, 1, 2, 3 or 4; e = 1, 2 or 3; and f = 0, 1, 2, 3 or 4]; and



[wherein i = 0, 1, 2, 3 or 4; j = 1, 2 or 3; and k = 1, 2, 3 or 4].

Since formula (I) above excludes a = 0 and c = 0, and formula (III) above excludes k = 0, the ethylene glycol compounds recited in claim 1 of the present application **do not contain** a terminal hydroxyl (-OH) group.

Whereas EP1,219,674 discloses use of glycol compounds as initiators or crosslinking agents.

**Initiator (Ethylene glycol, Propylene glycol)**

EP1,219,674 discloses suitable polyols being reaction products of alkylene oxides with

initiators, and ethylene glycol and propylene glycol being examples of suitable initiators (see page 3, lines 16 to 19).

Ethylene glycol and propylene glycol used as an initiator in EP1,219,674 must contain terminal hydroxyl (-OH) groups reactive with alkylene oxides. Consequently, these glycol compounds are structurally different from the glycol compounds recited in claim 1 of the present application because the latter **do not contain** terminal hydroxyl (-OH) groups.

Further, the initiators used in EP1,219,674 are components used to prepare polyols, but not those to be added to blowing agents. In this respect, the glycol compounds used as initiators in EP1,219,674 are different from the glycol compounds recited in claim 1 of the present application.

#### **Crosslinking Agent (Ethylene glycol)**

EP1,219,674 teaches use of ethylene glycol as a crosslinking agent (optional additive) (see page 3, lines 35 and 36).

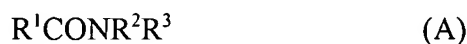
Crosslinking agents generally contain crosslinkable reactive groups on both ends. Ethylene glycol (HOCH<sub>2</sub>CH<sub>2</sub>OH) used as a crosslinking agent in EP1,219,674 contains hydroxyl (-OH) groups at both terminal positions. Therefore, this glycol compound is structurally different from the glycol compounds which **do not contain** hydroxyl (-OH) groups at either terminal position as recited in claim 1 of the present application.

**Other**

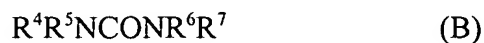
EP1,219,674 discloses ethylene glycol (additive A) and diethylene glycol (additive B). However, these glycol compounds also contain –OH groups at both terminal positions, and their structures are clearly different from those of the claimed glycol compounds, which **do not contain** a hydroxyl (-OH) group at either terminal position.

**Amide Compound**

The amide compounds recited in claim 1, as currently amended, are limited to those represented by the following formulae (A) and (B), based on the descriptions in paragraphs [0085] to [0087] of this application's published document 2005-0131091:



wherein  $R^1$  is a hydrogen atom, a lower alkyl group or a phenyl group; and  $R^2$  and  $R^3$  are the same or different, and independently represent a hydrogen atom or a lower alkyl group; with the proviso that  $R^1$  and  $R^2$  may form a heterocyclic ring in conjunction with the carbon atom of the carbonyl group to which  $R^1$  is bound and the nitrogen atom to which  $R^2$  is bound; and



wherein  $R^4$ ,  $R^5$ ,  $R^6$  and  $R^7$  are the same or different, and represent a hydrogen atom or a lower alkyl group, with the proviso that  $R^4$  and  $R^6$  may form a heterocyclic ring in conjunction with the nitrogen

atom to which R<sup>6</sup> is bound, the nitrogen atom to which R<sup>4</sup> is bound and the carbon atom of the carbonyl group.

Amide compounds represented by the above formulae (A) and (B) herein **contain no** hydroxyl (-OH) group at any terminal, and are not “polymeric.”

Whereas amide compounds taught in EP1,219,674 are polymeric polyols including hydroxyl-terminated polyamides and polyesteramides (see page 3, lines 24 and 25). More specifically, amide compounds of EP1,219,674 contain terminal hydroxyl (-OH) group, and are “polymeric”. Therefore, the amide compounds of EP1,219,674 clearly have different structures from those of the amide compounds recited in claim 1 of the present application.

Considering all of the above, claim 1 of the present application and other claims having the same constituent features of the invention cannot legally be anticipated by EP1,219,674.

### **Unobviousness**

Effects attained by adding the ethylene glycol compound and/or the amide compound to a blowing agent are, as described in paragraphs [0065] and [0097] of this application’s published document 2005-0131091, enhanced compatibility with system solutions, improved foam uniformity, reduced loss (through evaporation) of the blowing agent, etc.

In Example 4 (p.39 of the specification, or [0134]), the present inventors placed a mixture containing a polyol and a blowing agent mixture in a beaker, and measured the amount of blowing agent mixture lost through evaporation after 30, 60, and 120 minutes. Results of this example

demonstrate that the amount lost through evaporation of a sample containing a glycol compound (Sample B) is remarkably reduced in comparison with that of a sample containing no glycol compound (Sample A).

The inventors further present the following data demonstrating that the amount of blowing agent mixture lost through evaporation in a sample containing an amide compound (Sample C) is remarkably reduced compared with that of Sample A. Sample C is identical to Sample B, except that an amide compound was used in place of a glycol compound.

	30 min.	60 min.	120 min.
Sample A (no glycol or amide compound)	80.4 %	82.7 %	84.4 %
Sample B (containing glycol compound)	65.7 %	71.1 %	75.2 %
Sample C (containing amide compound)	67.0 %	72.2 %	76.1 %

As shown above, the glycol compound and/or amide compound recited in claim 1 of the present application provides a good effect in reducing amounts of the blowing agent mixture

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evaporated.

However, EP1,219,674 does not disclose achievement of such an effect achieved by the addition of an ethylene glycol compound and/or an amide compound into the blowing agent. As explained, EP1,219,674 does not teach the use of the glycol compounds or amide compounds with structures recited in claim 1 of the present application. Without any relevant teaching, it is logically impossible for a person skilled in the art to conceive of the claimed invention, based on EP1,219,674.

Considering the above, claim 1 of the present application and other claims having the same constituent features of the invention not only have novelty, but are also unobvious over EP1,219,674.

It is respectfully requested that the rejection be withdrawn.

**Claims 1, 3, 5, 6, 8, 10-13, 15-17 and 19-21 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-46 of copending Application No. 10/493,215. (Office Action, p.5)**

Again, the rejection is a provisional obviousness-type double patenting rejection over co-pending application Serial No. 10/493,215.

The status of application Serial No.10/493,215 as of December 28, 2006 was that the first non-final Office Action was mailed on November 14, 2006. It is assumed that if this application issues as a US patent before the co-pending application, the rejection will be removed voluntarily



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and an obviousness-type double patenting rejection will be made over the co-pending application.

The Examiner noted at the end of the rejection, on p.6 of the Office Action, that the applicants position stated in the July 6, 2006 Amendment, which is the same as above, is acceptable.

In view of the aforementioned amendments and accompanying remarks, claims 1, 5, 6, 10-13, 16, 17 and 20, as amended, are in condition for allowance, which action, at an early date, is requested.

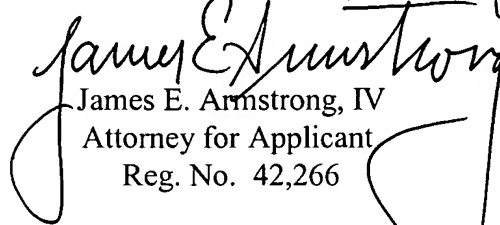
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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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